

**REMARKS**

Claims 1-2, 4-12, 16 and 20-66 are now pending in the present application with claims 3, 13-15 and 17-19 being canceled without prejudice or disclaimer of the subject matter contained therein. By the present amendment, new claims 20-66 have been added. Presently, claims 1, 2, 24, 39, 49 and 58 are independent.

**IDS**

The present application is being filed concurrent with the filing of an Information Disclosure Statement. Consideration of the documents listed in the Information Disclosure Statement is respectfully requested.

**Personal Interview**

Initially Applicants wish to thank the Examiners Sheng and Chang for the personal interview conducted on July 22, 2004. At the personal interview both the general differences between the preferred embodiments of the present application and the Usui reference were discussed, as well as the differences set forth in proposed claim amendments. Although no formal agreement was reached, a general understanding between the differences of the preferred embodiments of the present application, including applying a type of driving signal at least one of a selected plural number of times within a vertical synchronization interval, and the Usui reference, which applies a driving signal a fixed number of times based upon bit conversion, was reached. New

proposals for amending the claims were discussed. At that time the interview was concluded.

Applicants have amended the claims in line with the proposals discussed, in an effort to more clearly emphasize this distinction as will be explained hereafter. Applicants have further added additional claims which also are believed to distinguish from the Usui reference.

### **Rejections Under 35 U.S.C. § 112**

Initially, claims 5-6 have been rejected under 35 U.S.C. § 112, first paragraph. Specifically, the Examiner noticed some inadvertent errors in claims 5 and 6, wherein the words “current” and “previous” were reversed in the claims. These errors have been corrected, and as such, have rendered the Examiner’s rejection under 35 U.S.C. § 112, first paragraph, moot. Accordingly, withdrawal of this rejection is respectfully requested.

The Examiner has further rejected claims 13-15 and 17-19 under 35 U.S.C. § 112, second paragraph. While Applicants do not necessarily agree with these rejections, these rejections have been rendered moot in view of the cancellation of claims 13-15 and 17-19. Accordingly, withdrawal of this rejection is respectfully requested.

### **Prior Art Rejection**

The Examiner has rejected claims 1-4 and 7-11 under 35 U.S.C. § 102(b) as being anticipated by Usui et al. This rejection is respectfully traversed.

**Usui et al**

As explained in the personal interview, Usui et al. is directed to an image display apparatus. Specifically, Usui et al. is directed to determining a particular voltage indicating a gray scale value, determining a type of additional voltage which should be applied to a display device to achieve this gray scale value, and then converting that voltage to a plurality of values which adequately suit a specific type of display driver (designed to utilize fewer bits than that utilized by an A/D converter applying the gray scale signal).

A simplified driver is discussed in Usui et. al. for use in a simple matrix device, wherein the driver utilizes only a 3-bit signal. As explained in col. 6, lines 20-28 of Usui et al., a gray scale value to be applied is acquired by an A/D converter 12 as a 5-bit parallel signal. The 5-bit signal then has to be reduced and converted to a 3-bit signal for an application to a 3-bit display driver. Accordingly, instead of supplying a 5-bit signal for displaying gray scale values up to 32 levels, four 3-bit signals are used, each capable of displaying 8 levels of gray scale (wherein the combined gray scale value is 8, multiplied by the four signals, yielding 32 bits of gray scale). Accordingly, the 5-bit gray scale signal is applied as four 3-bit gray scale signals during display driving. Thus, the supply of the four 3-bit signals is dictated by the bit conversion.

**Claimed Distinctions**

Contrary to that set forth in Usui et al., the claims of the present application have been amended to state, in many different ways, that a vertical

synchronization interval is divided into a “selected” plural number of times or intervals, wherein the plural number of times or number of intervals is selected to improve step response characteristics of a liquid crystal display device. As shown in non-limiting exemplary embodiments of the present application set forth in Figs. 5, 9, 14 and 16, for example, and as supported by, but not limited to at least paragraphs 44, 52, 63, etc. of the present application,

Applicants have recognized that the step response characteristics of a liquid crystal display device can be improved by applying some voltage two, three or some other selected number of times within one vertical synchronization interval. Within one vertical synchronization interval, a voltage exceeding a target value can be applied a number of times as shown in Fig. 5, for example, or it may be applied one or more times in combination with other voltages applied in the other ones of the selected plural number of times within one voltage synchronization interval, as shown, for example, in Figs. 9, 14 and 16. Supplying some data value in at least one of a selected plural number of times within one vertical synchronization interval, wherein the number of times is selected to improve step response characteristics of a liquid display device, is not taught or suggested by Usui et al.

Applicants have amended claims 1 and 2 of the present application to clarify the distinctions over Usui et al. For example, claim 1 has been amended to clarify that an obtained image data value is supplied at least one of a selected plural number of times, wherein the number of times is selected to improve step response characteristics of a liquid crystal display device.

Somewhat similarly, claim 2 states that a data value is obtained to be supplied at least one of a selected number of times ... wherein the number of times is selected to improve step response characteristics of a liquid crystal display device. At least such features are not taught or suggested by Usui et al.

Accordingly, Applicants respectfully request allowance of claims 1 and 2, and all claims dependent thereon, in connection with the present application. Further, withdrawal of the Examiner's prior art rejection over Usui et al. is respectfully requested.

#### **Further Rejections**

The Examiner has further rejected claims 12-19 under 35 U.S.C. § 103 as being unpatentable over Usui et al. This rejection is respectfully traversed.

Initially, Applicants note that claims 13-15 and 17-19 have been canceled. Further, with regard to remaining claims 12 and 16, these claims are allowable for at least the previously mentioned reasons with regard to their corresponding independent claims. Accordingly, for the reasons previously set forth, Applicants respectfully suggest that claims 12 and 16 are allowable over the prior art of record. Withdrawal of the Examiner's rejection is respectfully requested.

#### **New Claims**

Applicants have further added new claims 20-66 in connection with the present application. New claims 20-23 are allowable for at least the reasons

previously set forth regarding their corresponding independent claims, as they are dependent on one of the previously mentioned independent claims.

Further, new independent claims 24, 39, 49 and 58 have been added. Although these claims are different from claims 1 and 2, wherein each claim should be interpreted solely based upon the limitations present therein and should not be limited in any way by limitations not present in the claims, these claims are allowable for reasons somewhat similar to that previously set forth above. Accordingly, allowance of each of new independent claims 24, 39, 49 and 58, and indeed allowance of each of new claims 20-66 in connection with the present application is earnestly solicited.

### **CONCLUSION**

In view of the foregoing, Applicants submit that claims 1-2, 4-12, 16 and 20-66 are patentable over the relied upon references, and that the application as a whole is in condition for allowance. Withdrawal of all objections and rejections and an early and favorable notice to that effect is respectfully solicited.


In the event that any matters remain at issue in the application, the Examiner is invited to contact the undersigned at (703) 668-8000 in the Northern Virginia area, for the purpose of a telephonic interview.

Pursuant to 37 C.F.R. 1.17 and 1.136(a), the Applicant respectfully petitions for a two (2) month extension of time for filing a response in connection with the present application, and the required fee of \$420.00 is attached

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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